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Executive Leadership

Development of a Vehicle Accident Guideline for the Odessa Fire Department

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CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

Signed: _____

ABSTRACT

The problem is that the Odessa Fire Department (OFD) has not been proactive in the development of a SOG that provides for the safety of personnel while working in or around a highway MVA. The purpose of this research was to develop a vehicle accident SOG. This research was accomplished through a literature review, Internet search and a survey.

The research questions included; What are the current SOGs in the OFD that address vehicle accident safety and what needs to change? What do other fire departments do to minimize injuries while working at highway accidents? What elements are needed to develop an effective SOG? Action research was used to the necessary components. The result was a vehicle accident safety SOG.

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Introduction

The Odessa Fire Department (OFD) has a long history of protecting its members through aggressive training and enhanced safety policies. An often forgotten safety issue is the realization that firefighters continue to be injured or die while responding to or working in or around vehicle accidents. Although injuries and death as the result of apparatus collisions seem to be the easiest to prevent, of the 106 firefighters who died in the line of duty in 2005, 26 were due to emergency vehicle accidents (USFA, 2006). The potential critical nature of this problem and the frequency, in which the members of the OFD have been reporting near misses, demands that the department take a more aggressive approach to the protection of its members while operating in and around highway vehicle accidents. Charlie Dickinson notes, "Fire departments have an obligation to adopt and enforce standard operating procedures that improve firefighter safety" (USFA, 2006). The problem is the OFD has not been proactive in the development of a standard operational guideline (SOG) that provides for the safety of personnel while working in or around a highway vehicle accident. The department prides itself in operating safely and with its member's safety as a top priority, but there are lessons and various programs that should be identified and adhered to as guides to further enhance safety in these types of incidents. The purpose of this research is to develop a clearly defined operational guideline to ensure the safety of personnel while working at the scene of a highway vehicle accident.

Action research was used to take immediate action to solve an existing or a potentially existing problem (NFA, 2004). This applied research project will address the following questions:

1. What are the current standard operating guidelines in the OFD that address vehicle accident safety and what enhancements need to be made?

2. What methods are other fire departments using to minimize fire fighter injuries while working at highway accidents?
3. What are the components needed to develop an effective vehicle accident guideline?

Background and Significance

The OFD was established in September of 1927 and provides service to a county area of 904 square miles. The area of incorporated city coverage is 37 square miles (Fire, 2008). The city population is approximately 98,000 and with the county the population grows to approximately 128,000. Odessa is between El Paso and Dallas, Texas and interstate 20 runs through the southern part of town. The OFD provides service from eight fire stations strategically positioned around the community. The front line fleet consists of six engines, two quints, and five front line medics. The engines and quints are Advanced Life Support (ALS) units that carry four firefighters, one of which is a certified Paramedic. The medic units are staffed with at least a Paramedic and an Emergency Management Technician (EMT). There are also two tankers, a regional (17 county) hazardous materials unit, air truck and rescue truck (high angle rescue, swift water rescue and confined space rescue). The reserve fleet consists of two engines and three medics. The department consists of 168 full time employees of whom 156 are full time paid firefighters, 5 are in the Fire Marshall's office and 7 administrative staff. The primary industry in the community is oil and gas (About, 2008).

The West Texas area is experiencing an economic growth in the wake of the increased cost of a barrel of oil. The local economy has always been dependent on the oil business and as the city expands outwardly to accommodate the increase of citizens and

infrastructure, the increase in vehicle accidents has also increased. A major freeway, Interstate 20, which runs through the community on the southern part of town, borders Odessa. Two other major highways, Hw385 and Hw302, traverse through the community to the north and south and also to the west.

On July 26, 2008, while working a vehicle accident on Loop 338 and Hw302, a passerby struck an OFD firefighter with his passenger side view mirror. The impact knocked the firefighter to the ground, but he was not injured and did not require any medical assistance (J. White, personal communication, September 4, 2008). At the time of the incident, the engine crew had been walking back and forth across the roadway getting no-transport signatures. This was an everyday incident and no special control measures were in place.

Firemen tend to get blinders on as they enter a vehicle accident and focus on patient care. There has to be a balance of both patient care and scene management. Herein lays the sheer essence of this research, to be able to establish a more consistent and safer approach to manage the accident scene and the emergency personnel working in and around the scene.

There are several factors or more common causes of firefighters being struck by vehicles while working around highway vehicle accidents. The following is a summary of causal factors that have been noted in incident reports and through experience:

- Lack of training
- Lack of situational awareness
- Failure to establish a proper Temporary Traffic Control (TTC) zone
- Improper positioning of apparatus

- Inappropriate use of scene lighting
- Failure to use PPE and high-visibility apparel and safety equipment
- Careless, inattentive, or impaired drivers
- Reduced vision driving conditions
- Altered traffic patterns

(TIMS, 2008)

The OFD has been very fortunate in that it has not endured any loss from a member being injured or killed in a vehicle accident. That alone does not lend itself to ignoring the problem and just hoping it does not happen in your jurisdiction. As a newly appointed administrator, it is very important to provide the tools and foundation for the members of the OFD to be successful in their careers and to return home from a tour of duty every morning.

Past Impact

The past impact to the OFD has been minimal. There have not been any reportable injuries from a lack of having a dedicated highway safety procedure. The theory or thought has relied on the hope that the citizens on the road are paying attention and are not impaired as they transverse through the accident scene. There have been near misses reported by different company officers. It is important that the department not wait until there is a reportable accident or death before researching and developing a standard for operating at highway vehicle accidents.

Present Impact

The present impact to the OFD is that there have been instances of near misses. Several of the Captains have reported that a vehicle snuck around an engine and surprised

them as they worked in the accident scene. The lack of an SOG that addresses highway vehicle accident safety is really gambling with the firemen's lives in the OFD. The web sites, firefighterclosecalls.com and respondersafety.com both track and provide lessons learned from highway vehicle accidents. The first step will be to establish an effective vehicle accident guideline. The present impact is to ensure that the OFD does not have an injury or death because of a lack of training and/or procedure.

Future Impact

One of the main obstacles that face the OFD is an age factor. The department is retiring a lot of seniority and experience. Obviously in this equation, there are less experienced drivers/engineers and officers making critical split second decisions. Approximately 1/3 of the department has less than three years of experience. The highway safety guideline is a huge step in training these younger firefighters to see more of the big picture. The future impact is to lessen the risk of any of firefighters or citizens from being injured while working in or around a vehicle accident. This research will certainly point to additional training opportunities especially as they relate to the response to these same incidents.

This research serves to complement the USFA Operational Objective of responding appropriately in a timely manner to emerging issues in the fire service (NFA, 2004). The emerging issue is still the increasing number of firefighters killed or severely injured while responding or working in or around a vehicle accident. Over the last decade (1996-2006), vehicle collisions claimed 227 firefighters lives, and another 52 firefighters were lost as a result of being struck by a vehicle (TIMS, 2008). Parker (2001)

notes, "…vehicle-related incidents were the second-highest cause of death in 1999, second only to overexertion/heart attack…" (p.19).

This research was conducted according to the leadership qualities of the National Fire Academy's Executive Fire Officer Program (EFOP) for the Executive Leadership (EL) curriculum. Leadership is a process through which an individual influences others toward the accomplishment of common goals (Homeland, 2005).

The plan to carry out this program is by utilizing action research methods, as discussed in Module 2 of the Executive Development program of the EFOP. This research will provide the framework to initiate a standard operating guideline for the members of the OFD to successfully operate on a vehicle accident scene. As an EFOP participant, it is important to be a catalyst in the communities we serve and bring forth programs, thoughts and ideas that will have positive and measurable impacts in the cities we serve. In other words, the collective vision of the department is outward instead of inward (NFA, 2005).

Literature Review

The purpose of this literature review is to identify the major components necessary to ensure firefighter safety while working in and around vehicle accident scenes. The review includes the findings of other researchers in the fire service, public and private sectors.

The literature review was organized around three specific research questions that were developed to help find the answers about the specific research topic. Those questions included (1) What are the current standard operating guidelines in the OFD that

address vehicle accident safety and what enhancements need to be made? (2) What methods are other fire departments using to minimize fire fighter injuries while working at highway accidents? (3) What are the components needed to develop an effective vehicle accident procedure?

The first area for review is to identify what present standard operating guideline (SOG) exists in the OFD that pertains to vehicle accident safety. The OFD currently has in place Standard Operation Guideline (SOG) 200.07 *Vehicle Accidents* (Appendix A) designed to establish procedures for wearing protective equipment at vehicle accidents. The guideline identifies that "The purpose of this guideline is to identify standard procedures for the use of PPE at vehicle accidents" (Odessa, 2007). The guideline was established in 2007 because firefighters were working vehicle accident scenes while wearing their normal duty apparel. The firefighters were not prepared to engage in vehicle extrication and were not protecting themselves from the elements of a vehicle accident.

There was also an incident of the firefighters not wearing their PPE and arriving on scene to find a vehicle fully involved in fire. In October 2007, an engine and a medic responded to a vehicle accident and on arrival, the vehicle was fully involved in fire. The firefighters from the engine had to extinguish the fire utilizing only their bunker coats and helmets (K. Doan, personnel conversation, October 27, 2007). The SOG in no way addresses protective measures to ensure scene integrity.

Between 1995 and 1999, 17 firefighters were struck and killed by motorists, according to a NIOSH report (Traffic, 2001). This represented an 89% increase in this type of line-of-duty death from 1990 to 1994. A line-of-duty death that occurred in

Midwest City, Oklahoma, prompted the Plano, Texas, Fire Rescue to institute an apparatus positioning policy. Although the department had not suffered a catastrophic loss, they realized the potential and the need to develop a highway safety operations policy. Fairfax County, Virginia, Fire and Rescue developed a manual to outline appropriate highway operations. This manual, *Operating Procedures for Highway Incidents*, is now used in place of a SOP (EVSI, 2004).

Mark McFall (2001) from the NIOSH Division of Safety Research notes, "that an effective emergency operation SOP should address the following: positioning apparatus, closing and/or clearing traffic lanes, establishing a secure work area, wearing appropriate protective clothing at all times, and releasing the incident back to normal operation" (p.62). In early 2007, the National Traffic Incident Management Coalition (NTIMC) was successful in the development of a National Unified Goal (NUG) for Traffic Incident Management (TIM). The NUG is a unified national policy that encourages State and local transportation and public safety agencies to adopt unified, multidisciplinary policies, procedures, and practices that will dramatically improve the way traffic incidents are managed on U.S. roadways. The NUG is organized around three major objectives: responder safety; safe, quick clearance of roadway incidents; and prompt, reliable incident communications (TIMS, 2008).

Plano Fire Rescue Department (1999), McFall (2001), and TIMS (2008) all identify varying degrees of SOG implementation from the local and national levels. However, the main emphasis on developing a policy and/or procedure is paramount in the successful management of vehicle accident scenes.

Another area for review is to establish the components necessary to develop an effective highway vehicle accident procedure. Wilbur (2001) adds that the following recommendations are necessary to help prevent tragedies while working along the nation's highways and interstates: implementation of department SOPs; proper apparatus positioning; control of oncoming traffic; personnel positioning in a secure area; and use of other agencies. Elvey (2001) also includes driving to the scene; roles and responsibilities of police, fire, and EMS; non-emergency response; emergency response; and emergency incident command.

Other research from the Plano Fire Rescue (1999) encourages safety benchmarks; protective clothing; terminology; safe positioning of apparatus; and limited access, high volume highway operations. Whereas the Federal Highway Administration suggest the following as A Compilation of Good Practices: goals; accountability; training; monitoring and evaluation; integrated database; safety analysis; coordination; and technology and information exchange. Wolf (2004) asks "do we need to make a coordinated effort with these other agencies to carry out multiagency traffic-control procedures (p.32)?"

Additional research indicates that there should be a minimum standard for incident management of traffic. The Manual on Uniform Traffic Control Devices (MUTCD) (2003) establishes that there are four stages of every temporary traffic-control zone that should be implemented: advanced warning; transition; activity; and termination (see Appendix B).

A review of other articles discovered the importance of common language, especially when multi-agencies are involved. Moore (2003) establishes that common

terminology is essential and will “reduce confusion, improve the safety of responders and make operations at the scene more efficient” (p.27). A list of common language/terminology is listed in the definition of terms. Other references use the varying types of common language, but this author could find no other research that indicated the importance.

The National Fire Protection Association (NFPA) standard 1521 *Standard for Fire Department Safety Officer* establishes the need for a dedicated Safety Officer when working at vehicle traffic accidents. NFPA 1521 (2008) establishes that “the incident safety officer shall evaluate motor vehicle incident scene traffic hazards and apparatus placement and take appropriate actions to mitigate hazards” (p.13). Additional research provided that the Traffic Incident Management Handbook (TIMH) provides for a similar concept for the use of a safety officer. TIMH (2000) indicates, “effective site management can be facilitated by an incident command system (ICS)” (p.14).

Additional research leads towards apparatus placement on the arrival of a highway vehicle accident. TIMS (2008) notes that fire apparatus must be placed between the flow of traffic and firefighters; the apparatus must be parked at an angle with front wheels turned away from the working firefighters; and consideration should be given to placing an additional apparatus 150 to 200 feet behind the shielding apparatus to act as an additional barrier. McFall (2001) notes, “Position fire apparatus uphill and upwind to take advantage of topography and weather to protect firefighters from traffic” (p.63). Cincurak (2004) has a more specific rule of thumb for apparatus spotting, “We need to position our vehicles at a 45-degree angle to the roadway to block the lane or lanes of traffic in which you will be operating” (p.19). Sullivan (2001) also notes the importance

of parking the apparatus at a 45-degree angle and turning the front wheels in the same direction of the angle.

Additional research points towards training of personnel as a vital component of en effective safety plan. The Emergency Vehicle Safety Initiative (EVSI) (2004) notes that the Phoenix Fire Department implemented their apparatus positioning SOP by using videos, practical training, and demonstrations on how to set up work zones, position, and hands-on practice. Plano Fire and Rescue implemented their SOP by planned tabletop exercises, followed by roadway exercises. The Fairfax County provides the information to new recruits and members receive the information during driver training. Changes are communicated via Internet, in-station discussion, and/or quarterly training at the academy. Sullivan (2001) adds that "All personnel should be trained in highway incident safety before they ever respond to an emergency" and "firefighters need to be trained to exit on the side away from moving traffic whenever possible" (p.91). Cincurak (2004) adds that the first part of training should be a tabletop training discussion – attended by company officers and local law enforcement agencies. The tabletop discussion should be followed up by hands-on training exercises.

Other research gets into scene marking and safety apparel of the responders. Dealy (2001) notes that the traffic barriers need to be built utilizing traffic cones, flares, or barricades. He also advises to use "Orange traffic cones with dual reflective stripes…because they are visible from a great distance in daylight hours and are universally recognized" (p.49). Soloman (2002) adds that cones are much more effective than flares because an inattentive driver may be alerted as they make contact with a cone. He also suggests utilizing light towers at night to illuminate the scene.

The research provided a lot of different views on all aspects of implementing a highway vehicle accident SOG. Wilbur (2001) and Elvey (2001) both offer ideas for implementing SOPs, but each offer a little variation or additional ideas for thought. Dealy (2001) and Soloman (2002) both suggest utilizing traffic cones for scene marking, but Dealy (2001) goes into the specific color of the cone. Other research indicated that everyone has a varying position on marking suggestions based on the road types, conditions, and time of day. Every fire department has implemented the training in varying degrees to ensure the department is familiar with the SOG before implementation. It is of the author's opinion that the development of a SOG for the safety of personnel while working in and/or around a highway vehicle accident can go a lot of different directions and the framework is pre-defined in the literature.

Dealy (2001) notes that there are several components to building an effective highway vehicle safety procedure: preplan and collaborate; build effective barriers and shields; utilization of proper equipment; assign personnel to traffic barriers; and involve outside resources. All of these components and effective training on each will provide an effective procedure. Sullivan (2001) lists the following components to build a checklist of incident command activities: channel traffic; proper apparatus lighting; coordination with law enforcement; protection of the scene with apparatus; proper personal protective equipment; and an effective personnel accountability system. Cincurak (2004) notes that planning should be broken down into two parts: approaching the scene and protection of personnel.

Procedures

The purpose of this research was to determine what components are necessary to develop and a standard operating procedure for the enhanced safety of firefighters while working in and around a highway vehicle accident. The research procedure used for the preparation of this paper began with a literature review at the Learning Resource Center (LRC) at the National Fire Academy (NFA) in Emmitsburg, Maryland.

The focus was to identify resource materials and journals that focused on components necessary to formulate a highway vehicle accident procedure. An internet search was conducted using the search engine, Google, and using the keywords, 'Highway Safety SOPs'. The initial search produced over 22,000 hits. The Responder Safety web-site was indentified during this search that proved to be valuable to identifying procedures to be considered in the formulation of a SOP.

A survey was formulated to seek input from other departments in relation to highway vehicle accident safety (Appendix C). The purpose of the survey was to find out how other fire departments have addressed highway safety. The survey was developed using questions that would help this author address this research question and establish what resource materials other departments have used.

The sample size was determined by utilizing Advocates for the 16 Life-Safety Initiatives. The Life-Safety Initiatives were found on the Everyonegoeshome.com web-site (Everyone, 2008). This author became aware of this program while attending the National Fire Academy (NFA). Life-Safety Initiative #11, "National standards for

emergency response policies and procedures should be developed and championed" is the basis for inclusion of this group (Everyone, 2008). This author felt this group would be a great source for information since they are advocates for firefighter safety on a national level.

SurveyMonkey.com was utilizied to deliver the survey on June 15, 2008 to the Advocates. There were a total of 101 Advocates listed on the web-site. A random sample was utilized starting with the first Advocate listed and including every fourth member after that for a total of 34. Out of the 34 surveys sent via e-mail, 30 were returned with at least some of the questions answered.

An additional Google search using the keywords, 'Highway Safety', produced over 16 million hits. The Federal Highway Administration (FHWA) and The National Highway Traffic Safety Administration (NHTSA) were found and utilized from the search on 'Highway Safety'. These sites provided the framework necessary to answer the questions proposed in this research project.

A literature search conducted at the LRC in Emmitsburg, Maryland also produced the United States Fire Administration's *Traffic Incident Management Systems* (TIMS) and the *Manual on Uniform Traffic Control Devices* (MUTCD). These reference materials would provide the most amount of information in relation to building a standard operating guideline for the OFD.

This author also conducted interviews with several Company Officers of the OFD in relation to close calls that had been reported. The hope was to be able to get first hand

knowledge about the events/incidents that have ultimately lead to the formulation of a SOP. The "Conducting Interviews" Section of the EFOP Applied Research Self-Study Course provided guidance when speaking with the Company Officers (NFA, 2004).

One limitation of this research was the age of some of the references utilized. There is probably more current information available regarding the safety of firefighters while working around moving traffic. Another limitation was the sampling for the survey should have been kept to departments of similar size and location as the OFD. There are a lot of factors to be considered when developing an SOG and all areas of the country are not the same. The survey questions should have been more specific and not as open-ended.

The goal of this research is to develop an SOG on vehicle accident safety. Action research is used and development, implementation, and evaluation are the key components for this type of research. The literature review and procedures section of this research will provide the basis for development of a part-by-part process.

Definition of Terms

Apparatus – fire department engine or truck company apparatus.

Block – positioning a fire department apparatus on an angle to the lanes of traffic creating a physical barrier between upstream traffic and the work area. Includes 'block to the right' or 'block to the left'.

Buffer Zone – the distance between the protected work zone and moving traffic at a vehicle-related highway incident scene.

Downstream – the direction that traffic is moving as it travels away from the incident scene.

Upstream – the direction that traffic is traveling from as vehicles approach the incident scene.

Flagger – a fire department member assigned to monitor approaching traffic and activate an emergency signal if the actions of a motorist do not conform to established traffic control measures in place at the highway scene.

Shadow – the protected work area at a vehicle-related roadway incident that is shielded by the block from apparatus and other emergency vehicles.

Taper – the action of merging several lanes of moving traffic into fewer moving lanes.

Work Zone – the physical area of a roadway within which emergency personnel perform their fire, EMS and rescue tasks at a vehicle incident.

Results

Research Question #1

What are the current standard operating guidelines in the OFD that address vehicle accident safety and what enhancements need to be made?

The department currently has SOG 200.07, *Vehicle Accidents* in place. The guideline identifies the procedures for use of Personal Protective Equipment (PPE) while working in or around vehicle accidents. The guide provides for exactly what should be worn and that Command has the authority to increase or decrease the level of PPE to address the needs of the incident.

Plano Fire Rescue (1999) provides for areas for consideration in a guideline for moving vehicle traffic: safety benchmarks; common terminology; protective clothing; apparatus positioning; and high-volume, limited access highway operations. The NIOSH Safety Division also adds: closing and/or clearing traffic lanes; establishing a secure work area; and releasing the incident back to normal operation. The OFD does not address any of these considerations in the *Vehicle Accidents* SOG.

Research Question #2

What methods are other fire departments using to minimize fire fighter injuries while working at highway accidents?

A sample framing of 34 surveys was e-mailed out for completion. The framing size produced a sample size of 30 or 88% return over a three-week period. It was determined that out of the 30 returns, 25 or 83% already had a SOG in place to ensure the safety of personnel while working on highway motor vehicle accidents. The survey also provided that of the 25 that had a SOG in place, 4 or 16% had an incident in their community that necessitated the need for the SOG.

Question one asked, “How many sworn firefighters does your department have?” The 30 responses were as follows: 23% have between 5 and 50; 33% had between 51 and 100; 20% had between 101 and 150; and 23% had more than 151 sworn personnel.

Another element of the survey asked if the SOG only pertained to highways or all vehicle accidents? Twenty-three respondents answered this question and 18 or 78% has an SOG that pertains to all vehicle accidents. Other interesting information provided that 42% of the departments send more than one fire apparatus to these types of incidents.

Question ten asked, “Does the SOG require any additional safety equipment?” The following responses came from this question: 90% indicated that their policy requires safety vests; 81% indicated that their policy requires safety cones; 33% indicated that they use flares; 14% use LED ground lighting; 52% use scene lighting at night; 67% wear fire suppression helmets; .05% use safety helmets; 71% use bunker gear only; 48% had a dedicated spotter; and 43% had dedicated police support.

Question nine asked them to identify all resource materials (either fire service or non-fire service) used to develop their SOG. The following responses were provided: DOT Regulations; Respondersafety.com and Firefighterclosecalls.com; NIOSH reports and other FD SOG’s; MUTCD Manual; NFPA 1500; “10 Traffic Cones of Safety”; IAFC; VFIS Highway Safety Manual; SOG’s from Regional Partners; NFA and NFFF; and Volunteer Fireman’s Insurance Service Highway Safety Course.

Additional feedback was solicited in the survey in the form of any additional information that would be beneficial in the development of a highway vehicle accident

policy. Some of the responses provided: two chiefs respond to act as spotters and safety officer; Battalion Chief responds for command and control; Battalion Chief on all class 3 highways as safety officer; and respond with an extra apparatus to act as safety buffers.

Research Question #3

What are the components needed to develop an effective vehicle accident procedure?

It was established during the research that there are multiple standards that address highway vehicle safety. Information gathered from TIMS provided are very well rounded overview of all of the components needed for inclusion into an effective vehicle accident procedure. The TIMS study also provided multiple case studies in which to consider. An article by Cincurak stressed the importance of implementing an incident command structure and training. Cincurak also encouraged the reader to share SOPs with other departments and try not to reinvent the wheel when developing procedures. EVSI made recommendations on cone placement, reflective vests, and scene lighting to name a few.

An article by Sullivan provided information about protecting the scene with apparatus and the importance of coordination with law enforcement. McFall discussed the importance of establishing and working within a temporary work zone.

The result of this research provided for SOG 200.37, *Vehicle Accident Safety* (Appendix D). The key components of this research provided for the base development of SOG 200.37. The SOG will be implemented through the training division and feedback will be solicited to be able to effectively evaluate the procedure.

Discussion

The research sought out as much information as possible in order to provide the most up to date knowledge of the subject. It is very obvious to this author that the OFD is way behind the industry standards in the implementation of a highway safety SOG.

The sample framing for the survey could have been much higher, but this author was pleased with an 88% return rate. The target audience seemed to be in line with the subject matter and provided good feedback on recommendations. This author was surprised by the percentage of departments 83%, which already had an SOG in place for highway vehicle safety. This author was also surprised that 78% of the departments polled had a policy that provided for all accidents and not just highway accidents.

This author was a little surprised that 84% of the respondents had not had an incident that necessitated their SOP development. The 84% percentage established to the author that the fire service as whole is more aware and proactive in the development of operational procedures. The Plano, Texas, Fire Rescue has developed an apparatus positioning policy, after a line-of-duty death in Midwest City, Oklahoma, even though they had not suffered a catastrophic loss (EVSI, 2004). In contrast, 16% of the departments surveyed had suffered an incident that necessitated their SOP implementation. There are still a lot of reactive measures that are taken across the fire service as opposed to proactive ones.

This author found it interesting that the Fairfax County Fire and Rescue developed a manual, *Operating Procedures for Highway Incidents* that is now used in place of a SOP (EVSI, 2004). The OFD does not even have an SOG that pertains to highway incidents and Fairfax has an entire manual dedicated to their personnel's safety.

The NTIMC was successful in the development of the NUG. The NUG encourages State and local transportation and public safety agencies to adopt unified, multidisciplinary policies, procedures, and practices that will dramatically improve the way traffic incidents are managed on U.S. roadways (TIMS, 2008). This is an incredible piece of work that reaches out to all states in hopes of adopting national standards. However, it is similar to the highway speed limits in that every state wants to control their own highways and not have unfunded mandates.

Wilbur (2001) adds that the prevention of tragedies along the nation's highways depends on implementation of department SOPs, proper apparatus positioning, control of oncoming traffic, personnel positioning in a secure area, and use of other agencies. Elvey (2001) also adds driving to the scene; roles and responsibilities of police, fire, and EMS; non-emergency response; emergency response; and emergency incident command. These authors are writing about the same subject matter but go into greater detail in certain areas that can be a little overwhelming.

TIMS (2008) notes that fire apparatus must be placed between the flow of traffic and firefighters and the apparatus must be parked at an angle with front wheels turned away from the working firefighters. In contrast, McFall (2001) notes to "Position fire apparatus uphill and upwind to take advantage of topography and weather to protect firefighters from traffic" (p.63). Cincurak (2004) has a more specific rule of thumb for apparatus spotting, "We need to position our vehicles at a 45-degree angle to the roadway to block the lane or lanes of traffic in which you will be operating" (p.19). The literature noted all talks about spotting apparatus, but several go into great detail about how to spot the apparatus.

This author had a preconceived idea that the material gathered would be simple and straight to the point. However, that is not the case as much of the literature goes into great detail. Several of the authors noted, focus on specific elements and others give a wider more overall view. The challenge is to determine what elements have more merit and inclusion into a SOG. Not every area has the same demographics and surroundings and therefore it should be important to tailor the SOG to the individual needs of department.

The expected benefits of the resulting SOG are a safer environment for the firefighters to work and a more acute awareness of their surroundings. This author would be naive to believe that a SOG geared toward providing a safer environment to work within the parameters of a vehicle accident is all encompassing and will prevent every injury. This author subscribes to the secretlist.com web site and gets daily reminders of the dangers that firefighters endure. In some of the line-of-duty deaths, the firefighters did everything right and still become a casualty. However, if this SOG can create a more acute awareness of the surroundings for the firefighters, then perhaps a member of the OFD will not become a statistic.

Recommendations

The OFD is not unlike a lot of other departments in that they strive to provide the safest environments for their employees to work. The OFD is also not blessed with a lot of resources and the members are often asked to do much more than a department twice their size. It is very important that the administrative staff is continually seeking and

striving to provide the framework necessary to ensure some level of accountability to its members.

The following are recommendations based on the research presented:

1. The results indicate that there are a multitude of resources available to assist in the development of a highway vehicle safety SOG. Many departments already have these systems in place and there is no need to have to start from scratch when developing a new operational procedure.
2. My recommendation based on the research will be for the OFD to purchase traffic cones for all fire and medic apparatus. The department recently purchased all new safety vests. The Training Division will deliver training and then the SOG will be implemented. A timeline will need to be put into place for training to ensure timely delivery to all affected personnel.
3. The anticipated benefit from SOG 200.37, *Vehicle Accident Safety* will be a department that is more alert to its surroundings. It will also be a department that has to be accountable to each other and ensure the safety of all personnel on scene. The goal is for the department to be fully functioning with the SOG within thirty days of implementation. Evaluation will be a key component to ensure the product matches the anticipated operational benefits.
4. Additional research needs to be a continuous process in this subject matter. There are always other agencies and organizations that find ways to do things better and more efficiently. It is almost an essential element that the local police also get involved in this process. No department can provide all of the resources sometimes needed on large highway accidents. There has to be a team concept

and other agencies become a part of the team. This research was very narrow and needed to be broaden and more specific. The surveys should have been more focused and specific. There is a lot to learn from other departments in the fire service but the research has to be driven towards specific features. The research provided that this subject matter can be so enormous that the end product becomes so large that no one can remember all of the components and following the SOP to the letter becomes very challenging. It was apparent to this author that just researching 'how to spot an apparatus' could be a paper by itself. Further research needs to more focused and continuous monitoring, through the shift Captains and Battalion Chiefs, will be essential.

5. Implementation will start by sharing some of the recent data about firefighter injuries or line-of-duty deaths in relation to accident safety with the members of the OFD. The next step will be to have the Training Division give a class on situational awareness. The Battalion Chiefs will be brought into the mix to ensure that they do not see any operational issues not previously addressed. Classroom and hands-on training will ensue to enable the firefighters to ask questions and practice the concepts established. Once all members of the department have been trained, the SOG will be implemented. An evaluation period will be established that allows the members to provide feedback and changes made accordingly.
6. Researchers that wish to replicate some or part of this study need to be more focused in the results desired. The survey questions need to be really thought out with specific answers desired. It is important to stay away from the 'yes or no' types of questions. Those types of questions sometimes force the author to come

to their own conclusions because the questions are too open ended. Seek sources that have no relation to the fire service because they tend to be more specialized in their fields.

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Appendix A

Fire Department
Standard Operating Guidelines

NAME / SUBJECT OF GUIDELINE **GUIDE NUMBER: 200.07**

Vehicle Accidents

SECTION **REVISED: 12/26/2007**
0200 - FIRE

PURPOSE:
The purpose of this guideline is to identify standard procedures for the use of PPE at vehicle accidents.

Fire Medic personnel shall be in bunker coat and helmet (firefighting or other) prior to or on arrival to the scene. Bunker pants must also be worn if personnel are wearing shorts.

One firefighter on Engine and Truck Company's shall respond on all vehicle accidents in full personal protective clothing, helmet with face shield, nomex hood, turnout coat and pants with boots, and gloves. Captains, Engineers and one firefighter will operate in a minimum of bunker coat and helmet.

Command may use discretion to regulate the use of full personal protective clothing in those situations where the scene has been controlled, stabilized and deemed safe. A helmet and reflective vest will be the minimum level of personal protective clothing permitted while operating in or near roadways.

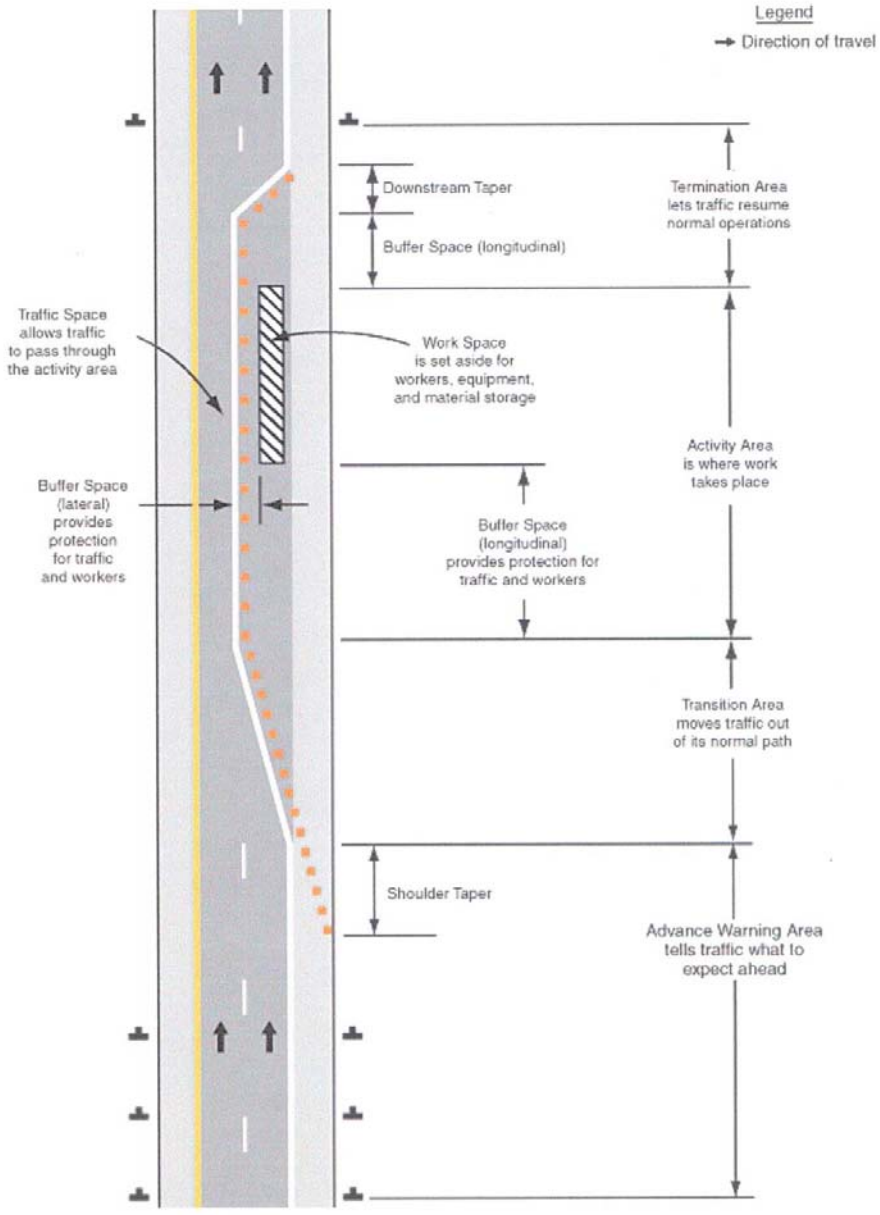
Command has the authority to increase or decrease the level of PPE to address the needs of the incident, including patient care.

Appendix B: MUTCD Temporary Traffic Control (TTC) Zone

Manual on Uniform Traffic Control Devices (MUTCD)

Knowledge

Figure 6C-1. Component Parts of a Temporary Traffic Control Zone



Appendix – C

Highway Vehicle Accident Safety Survey

I appreciate you assistance in completing the following survey. This survey will be instrumental in the development of an SOG for the safety of personnel while working in and or around a highway vehicle accident.

Thanks again for your participation!

1. How many sworn firefighters does your department have?
   - ☐ A. 5 – 50
   - ☐ B. 51 – 100
   - ☐ C. 101 – 150
   - ☐ D. 151 +

2. What is your daily staffing?
   - ☐ A. 10 – 25
   - ☐ B. 26 – 50
   - ☐ C. 51 – 75
   - ☐ D. 75 +

3. Does your department have a dedicated SOG to ensure the safety of your personnel while working in or around a highway motor vehicle accident?
   - ☐ A. Yes (Skip to Question #5)
   - ☐ B. No

4. If No, are there any interstates or major highways that pass through your community?
   - ☐ A. Yes
   - ☐ B. No

5. If Yes to question #3, was there an incident that necessitated the SOG development?
   - ☐ A. Yes
   - ☐ B. No

6. Has there been a measurable period of time in which to evaluate the effectiveness of the SOG?
   - ☐ A. Yes
   - ☐ B. No

7. If Yes to question #3, does the policy refer only to Highway Incidents, or does it apply to all vehicle accidents?
   - ☐ A. Highway Only
   - ☐ B. All Vehicle Accidents

8. Please list all resource materials (either fire service and/or non-fire service) used to design the SOG.

9. Does the SOG require the automatic response of more than one (1) fire apparatus?
- ☐ A. One
- ☐ B. Two
- ☐ C. Three or more

10. Does the SOG require any additional safety equipment? (Please check all that apply)
- ☐ Reflective Vests
- ☐ Safety Cones
- ☐ Flares
- ☐ LED Ground Lighting
- ☐ Scene Lighting
- ☐ Fire Suppression Helmets
- ☐ Safety Helmets
- ☐ Firefighter Bunker Gear
- ☐ Spotter (s)
- ☐ Dedicated Police Support
- ☐ Additional Engine/Truck
- ☐ Other – Please Specify

11. Please list any other information that you feel would be beneficial in the development of a Highway Vehicle Accident Safety SOG.

Thank You for your assistance!

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Odessa Fire Department
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Appendix D

Fire Department
Standard Operating Guidelines

NAME / SUBJECT OF GUIDELINE **GUIDE NUMBER: 200.37**

VEHICLE ACCIDENT SAFETY

SECTION **REVISED: 1/1/2009**
200 - FIRE

OVERVIEW:
This guideline identifies parking practices for Fire Department apparatus and vehicles that will provide maximum protection and safety for personnel operating in or near moving vehicle traffic. It also identifies several approaches for individual practices to keep firefighters safe while exposed to vehicle traffic.

All personnel should understand and appreciate the high risk that firefighters are exposed to when operating **in** or **near** moving vehicle traffic. We should always operate within a protected environment at any vehicle-related roadway incident.

Always consider moving traffic as a threat to your safety. At every vehicle-related emergency scene, personnel are exposed to passing motorists of varying driving abilities. At any time, a motorist may be driving without a legal driver's license. Approaching vehicles may be driven at speeds from a creeping pace to well beyond the posted speed limit. Some of these vehicle operators may be vision impaired, under the influence of alcohol and/or drugs, or have a medical condition that affects their judgment or abilities. In addition, motorists may be completely oblivious to your presence due to distractions caused by cell phone use, loud music, conversation, inclement weather, and terrain or building obstructions. Approaching motorists will often be looking at the scene and not the roadway in front of them.

Nighttime incidents requiring personnel to work in or near moving traffic are particularly hazardous. Visibility is reduced and driver reaction time to hazards in the roadway is slowed.

PURPOSE:
It shall be the purpose of the Odessa Fire Department to position apparatus and other emergency vehicles at a vehicle-related incident on any street, road, highway or expressway in a manner that best protects the incident scene and the work area. Such

positioning shall afford protection to fire department personnel, law enforcement officers, tow service operators and the motoring public from the hazards of working in or near moving traffic.

I. Terminology

The following terms shall be used during incident operations, post-incident analysis, and training activities related to working in or near moving traffic.

1. **Advance Warning** – notification procedures that advises approaching motorists to transition from normal driving status to that required by the traffic control measures ahead of them.
2. **Block** – positioning a fire department apparatus on an angle to the lanes of traffic creating a physical barrier between upstream traffic and the work area. Includes 'block to the right' or 'block to the left'.
3. **Buffer Zone** - the distance between the protected work zone and moving traffic at a vehicle-related highway incident scene.
4. **Downstream** – the direction that traffic is moving as it travels away from the incident scene.
5. **Flagger** – a fire department member assigned to monitor approaching traffic and activate an emergency signal if the actions of a motorist do not conform to established traffic control measures in place at the highway scene.
6. **Shadow** – the protected work area at a vehicle-related roadway incident that is shielded by the block from apparatus and other emergency vehicles.
7. **Taper** – the action of merging several traffic lanes of moving traffic into fewer moving lanes.
8. **Transition Zone** – the lanes of a roadway within which approaching motorists comply with the traffic control measures established at an incident scene.
9. **Upstream** – the direction that traffic is traveling from as the vehicles approach the incident scene.
10. **Work Area** – the physical area of a roadway within which emergency personnel perform their fire, EMS and rescue tasks at a vehicle-related incident.

II. Safety Benchmarks

All emergency personnel are at great risk or injury or death while operating in or near moving traffic. There are several specific **tactical operations** that should be taken to protect all crewmembers and emergency service personnel at the incident scene including:

1. Never trust approaching traffic
2. Never turn your back to approaching traffic
3. Establish an initial block with the first arriving emergency vehicle or fire apparatus
4. Always wear Class III high visibility reflective vests during vehicle operations

5. Always wear structural firefighting helmet
6. Wear full protective clothing plus the reflective vests at all vehicle-related emergencies between the hours of dusk and dawn or whenever lighting levels are reduced due to inclement weather conditions
7. Turn off all illuminated sources of vision impairment to approaching motorists including vehicle headlights and spotlights
8. Use fire apparatus and police vehicles to initially redirect the flow of moving traffic
9. Establish adequate transition area traffic control measures to reduce travel speeds of approaching motorists
10. Use traffic cones where appropriate for sustained highway incident traffic control and direction
11. Establish a fire department member to the **Flagger** function to monitor approaching traffic and activate an emergency signal if the actions of a motorist do not conform to established traffic control measures in place at the highway scene

III. Apparatus and Emergency Vehicle Benchmarks

Listed below are benchmarks for safe parking of **Apparatus and Emergency Vehicles** when operating **in** or **near** moving traffic.

1. Always position first-arriving apparatus to protect the scene, patients, and emergency personnel.

    a. Initial apparatus placement should provide a work area protected from traffic approaching in at least one direction.
    b. Angle apparatus on the roadway with a **"block to the left"** or a **"block to the right"** to create a physical barrier between the crash scene and approaching traffic.
    c. Allow apparatus placement to slow approaching motorists and redirect them around the scene.
    d. Use the fire apparatus to block at least one additional traffic lane than that already obstructed by the crashed vehicles.
    e. When practical, position apparatus in such a manner to protect the apparatus operator from being exposed to approaching traffic.

2. Apparatus positioning must create a safe parking area for EMS units and other fire vehicles. Operating personnel, equipment and patients should be kept within the **"shadow"** created by the blocking apparatus at all times.

3. When blocking with apparatus to protect the emergency scene, establish a sufficient size work zone that includes all damaged vehicles, roadway debris, the patient triage and treatment, the extrication work area, personnel and tool staging area and the medic loading zone.

4. Medics should be positioned within the protected area work area with the patient loading area angled away from the nearest moving traffic.

5. Command shall stage unneeded vehicles off the roadway or return these units to service whenever possible.

6. At all intersections, or where the incident may be near the middle lane of the roadway, two or more sides of the incident will be to be protected.

    a. Police vehicles must be strategically positioned to expand the initial safe work zone for traffic approaching from the opposing directions. The goal is to effectively block all exposed sides of the work zone. The blocking of the work zone must be prioritized, from **the most critical** or **highest traffic volume flow** to the least critical traffic direction.
    b. For first arriving engine or truck companies where a charged hoseline may be needed, block so that the pump panel is **"down stream"**, on the opposite side of on-coming traffic. This will help to protect the pump operator.

7. Traffic cones shall be deployed from the rear of the blocking apparatus toward approaching traffic to increase the advance warning to approaching motorists and to identify the transition and tapering actions that are required.

8. Personnel shall place cones and retrieve cones while **facing** the traffic.

9. Traffic cones shall be deployed at **15-foot** intervals upstream of the blocking apparatus with the furthest traffic cones approximately **75-feet** upstream to allow adequate advance warning to drivers.

10. Additional traffic cones shall be retrieved from police department units or DOT units and used as necessary to extend the advance warning area for approaching motorists.

IV. Incident Command Benchmarks

The initial-arriving company officer and/or the Incident Commander must complete critical benchmarks to assure that a safe and protected work environment for emergency scene personnel is established and maintained including:

1. Assure that the first-arriving apparatus establishes an initial block to create an initial safe work area.
2. Assess the parking needs of the medics as well as later-arriving fire apparatus.
3. Assure that all medics on-scene are placed within the protected work area ("Shadow") of the larger apparatus.
4. Instruct the driver of the medic to "block to the right" or "block to the left" as it is parked at the scene to position the rear patient loading area away from the closest lane of moving traffic.

5. Assure that all patient loading in the medics is done from within a protected work zone.
6. The initial company officer and/or the Incident Commander must operate as the Scene Safety Officer.
7. Command shall ensure that for nighttime operations during the hours between dusk and dawn, apparatus and vehicle operators turn **OFF headlights** and leave **parking lights ON**. This will reduce the potential blinding affect of headlights shining into the eyes of drivers approaching the emergency scene.
8. Command shall assure that Opticom strobe lights are turned OFF and that other emergency lighting remains ON.
9. At residential medical emergencies, Command shall direct medics to park at the curb for safe patient loading whenever possible.

V. Emergency Crew Personnel Benchmarks

Listed below are benchmarks for safe actions of **individual personnel** when operating **in** or **near** moving vehicle traffic.

1. Always maintain an acute awareness of the high risk of working in or around moving traffic.
2. Never trust moving traffic.
3. Always look before you step!
4. Always keep on eye on the moving traffic!
5. Do not turn your back to moving traffic.
6. Personnel arriving in crew cabs of fire apparatus should exit and enter the apparatus from the protected 'shadow' side, away from moving traffic.
7. Officers, apparatus operators, and all medic personnel must exit and enter their units with extreme caution remaining alert to moving traffic at all times.
8. Protective clothing and Class III safety vest must be donned prior to exiting the emergency vehicle.

    a. During normal daylight conditions, don helmet and Class III safety vest or structural PPE and Class III vest (if extrication will be necessary) when operating **in** or **near** moving traffic.
    b. During dusk to dawn operations or when ambient lighting is reduced due to inclement weather conditions, don helmet, full structural PPE and Class III vest.
    c. All staff personnel and assigned student trainee personnel arriving on apparatus or emergency vehicle must don assigned helmet and Class III vest prior to exiting the vehicle.

9. Always look before opening doors and stepping out of apparatus or emergency vehicle into any moving traffic areas. When walking around fire apparatus or emergency vehicle, be alert to your proximity to moving traffic.

a. Stop at the corner of the unit, check for traffic, and then proceed along the unit remaining as close to the emergency vehicle as possible.
b. Maintain a ‘reduced profile’ when moving through any area where a minimum ‘buffer zone’ condition exists.

10. At intersection incidents, a call for police response is necessary. Provide specific direction to the police officer as to exactly what your traffic needs are. Ensure that police vehicles are parked to provide additional protection of the scene.